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The Analysis of the Impact of Cloud Computing-Based Human Resource Information System Implementation on HR Management Efficiency in Multinational Companies

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Abstract
This research examines the effectiveness of a cloud computing-based HR Information System (HRIS) on the efficiency of HRM in MNCs. Cloud computing helps streamline, flex and integrate HR data management and mitigates the dependency on local infrastructure, which is expensive and time-consuming. This application also improve access on real-time data improving synchronization among distributed teams. Adopting a quantitative method and causal descriptive research design, this research incorporated 150 participants, representing 10 multinationals ICTs firms that have embraced the use of cloud-based human resource information system (HRIS). The data was obtained by the means of questionnaires and analysed with the help of descriptive statistics and multiple linear regression analysis. The findings suggest that the adoption of cloud-based HRIS has a positive impact on HRM efficiency in terms of cost efficiency, cycle time reduction, data accuracy and user satisfaction. This indicates that this system provides stronger support of HR management capabilities, especially in the case of MTCS operating in more than one country.

Keywords:
Cloud Computing; HRIS; HR Management Efficiency; Multinational Companies; Data Management.

1. INTRODUCTION

Development of Information Technology Especially with the wide spreading of cloud computing, information technology has been used in the different aspects of the operation of companies. One such aspect that has undergone significant transformation is human recourse management (HRM). By adopting HR information systems based on cloud computing, companies can refine staff data management and free themselves from heavy reliance on local infra- structure, which is usually costly and time- consuming to maintain. Effective HRM poses particularly challenging problems to multinational companies that have operations in multiple countries. The cloud computing provides a solution in which the data is centralized and can be accessed in real time and provide a good collaboration between the world-wide team members. And that, in turn, can make productivity rise and strategic thinking come more easily. This paper focuses on the effects of the adoption of cloud computing-based HR information system on efficiency HR management in the MNCs. The findings will help us to understand the implications of cloud computing to enable HR work to be more efficient and effective.

The advance of technology in this digital age is evolving at an extraordinary pace and has had a dramatic effect on all aspects of organizations, including HR. Among the technological innovations that have been embraced is the cloud information geometry system. This technology allows the consolidation of HR data in a more efficient, flexible and integrated way for businesses. With the work pattern of CC, companies can also minimize to depend on local infrastructure that also prone to high cost and time cost on maintenance

(Aziz & Wardhani, 2018). HR Management Dilemma for MNCs MNCs are faced with the Herculean task of managing an effective HR Management in numerous cities across the globe. The answer rests in cloud computing, both as a major hub of data and as a way for multiple offsite teams to communicate, with the real time access and collaboration that they need. Research by Pratama et al. (2024), the implementation of cloud-based HRM system in multinational companies could have an influence on the coordination of teams, and hence on HR performance. In the same vein, a study conducted by Utami et al. (2024) and an HR intercountry cloud-based information system also show positive results. Thus, this has enhanced efficiency and effectiveness of HR management thus increasing the general organizations performance. Motivated by these concerns, this study investigates the effects of cloud computing on the efficiency of HR management in multinational enterprises. It is anticipated that the findings will help to deepen our understanding of the role of this technology in enhancing efficiency and effectiveness of HR management in multinational companies.

Human resource management (HRM) has undergone dramatic changes due to Industry 4.0, especially with the use of new technologies such as cloud technology. This becomes the means for secure handling of HR data for companies that want to operate HR more efficiently and flexibly while avoiding costs for physical infrastructure. Cloud computing enables organizations to have access to and manage employee information in real time and facilitates faster decision making in HRM (Sharma et al., 2024). Global corporations that have named branches in different nations can find it tough to take care of their HR. With cloud, data from various branches can be brought under one roof and accessed with ease which allows teams working from different locations to communicate and coordinate. Gautam et al. (2025), cloud-based technologies are changing the way in which organizations deal with employees by offering more efficient and more effective remedies to the typical HR problems of large companies. Unfortunately, with the pace of technological change, just as many of these employers have simply not yet adjusted to one of their future workforce development needs: upskilling employees to fit the age of automation and digitalization. According to Abugre and Nasere (2020), organizations that have implemented cloud HRM systems have an edge in improving employee job performance and productivity, particularly those MNCs in global markets. The purpose of this research is to investigate the effect of the introduction of a cloud-based HR information system on efficiency of HR management in multinational corporations by taking the transition to Industry 4.0 into account. The study aims to shed some light on how cloud technology backs enhanced and cost-effective HR management in multinational firms (Osipova, 2022).

HRM at MNCs MNCs have to manage people effectively in quite different cultures, rules and requirements in the different markets they are operating in. For effectiveness and to avoid time wastage, a good HR management system is necessary. This latter sense of creativity is important for organisations that face the challenge of balancing different approaches at each location but at the same time need to ensure that these approaches are aligned with and coherent with global HR policies elsewhere (Labrenz, Nehles & Bondarouk, 2017). Over recent years, technology has presented solutions to improving HR management such as tech-based information systems. According to Johns (2018) the application of HRIS in PT Aneka Sejahtera Engineering has made the significant improvement in terms of operational effectiveness and increase in data precision. Through the use of cloud computing technology, the company is less reliant on costly physical infrastructure and can provide the ability to manage data instantly, which would facilitate decision making. Moreover, technological breakthroughs are having an effect on HR management in other industries, including healthcare. Rizal et al. (2021) stress the need for desktop-developed IS design in HR data management that can be adopted in different kinds of organizations (e.g., organizations with big, extensive data needs). This is technologically more efficient and helps in speeding up and accurate information management.

HRM is central to the performance of the organization. One method of doing this is to set up a good HRIS system. Batviano, Tewal, and Sumarauw (2023) indicated that a well-design information system that is supplemented by the appropriate competencies of staff it employees can improve their work effectiveness. The better system means better internal working of the HR and more HR-management friendly decision making. Pahira and Rinaldy (2023) indicate that and optimum HR management is directly associated with organizational performance. The potential of your employees can’t be squeezed out without good management.It will have an impact on the whole performance of your company. It is important that hence companies have a HR management system that can make the most of existing resources and help employees in meeting the goals set forth by the organization. Additionally, Garini and Rahman (2024) also mention, that the right HR management strategy in public office, including the one in the Communications and Information Department of Banjar City, has been able to improve employee work achievement. They emphasize the significance of proper control of employees, in effect improving the performance level and successful achievement of goal progress in the public sector.

It can be difficult to handle human resources (HR) for international companies. To solve this problem, the use of cloud computing based HRIS has started gaining popularity. Through such technology, centralization of employee data can be achieved real time, contributing to more efficiency and accuracy in HR management for multi-branch businesses. Rustandi (2019) also indicates that advanced technology including cloud computing provides a greater degree of flexibility for companies to manage HR; therefore such companies can quickly adjust to changes in a global market. For global corporations, cloud-based

solutions make it easier to integrate HR data from around the world. According to Hakim (2023), with such technology in place, companies are able to better monitor and measure the employee's performance and speed up the decision-making. Data are directly accessible to HR managers and can be used to strengthen productivity and employee well-being. The adoption of cloud HR systems, moreover, can streamline administrative tasks and provide greater visibility of employee data. OrangeHRM Implementation of OrangeHRM at SMPIT Al-Qudwah Maidah and Rusmanto (2018) explain that SMPIT Al-Qudwah seeks to adopt an HRM (Human Resource Management) system in order to speed up human resource data management and enhance organizational performance.

SeriousHow Does the Adoption of CloudComputing Affect HRM Efficiency for MNCLs? And by introducing new technologies such as cloud computing, organizations can centralize the management of employee data, decrease reliance on physical infrastructure, and speed the delivery of information. Moreover, this capability allows for coordination within teams occupying different spaces, productivity, and helps reduce cycles for strategic decision making. Cloud computing has been shown to improve operational efficiencies, lower administrative costs, and streamline the management of HR data in the literature. This study is to provide overview of cloud computing based HRM impact and how such cloud technologies have supported improvements for more effective and efficient HR managements across the companies worldwide.

2. RESEARCH METHOD

This paper empirically utilizes a quantitative method using a descriptive causal design to assess the effect of deploying cloud computing-based Human Resource Information Systems (HRIS) on HR management efficiency in sedtors of Multi-National Corporation's (MNCs). This direction was opted for to mechanistically determine the factors influencing the efficiency of managers using an analytical process. The survey-based data were analysed statistically in order to explore the associations between the variables. The study contributes to further knowledge of the impact of cloud computing technology on the efficiency of HRM in global companies.

a. Population and Sample
This study pertains to multinational companies in Indonesia that have adopted the HR information system-based cloud computing, like what has been done by Latuconsina et al. (2024). A purposive sampling method was employed in selecting samples, these are the: companies that have been using HRIS that uses cloud computing for a period of one year, companies with more than 500 employees, and companies that have more branch or have international operations. In accordance with these criteria, a research sample of 10 multinational companies was chosen. A number of 150 respondents took part comprising HR mangers, HR staff, and employees who use the cloud computing HRIS in their daily activities. All employed respondents were randomly drawn from all qualifying companies. The research will involve different echelons of the company to develop alternative viewpoints to introduce this technology and to explore its effect on HRM efficiency among multinational enterprises.

b. Research Instrument
This research employs a questionnaire that has been developed for two major constructs: implementation of cloud computing based HRIS and HRM effectiveness as proposed by Rahmawati et al. (2024). The questionnaire is divided into two parts. The first group of questions relates to the adoption of a cloud-based HRIS overall including issues of perceived ease of use, its ability to be interfaced with other systems in the organisation, the ease with which data are available to relevant stakeholders and the reliability of the system to ensure continual running of operations. The second part pertains to HR management efficiency, consisting of items that capture the savings in operational cost, reduction in processing time (PT), and enhanced data accuracy (DA) and user satisfaction with the installed system. All items in the questionnaire are rated on a 5-point scale according to the Likert scale, ranging from 1 to 5 (ranging from 1 = strongly disagree, 5 = strongly agree). The survey aims to collect information on the impact of the adoption of cloud-based information systems on efficiency of HR management and on the use of systems by international companies.

c. Data Collection Procedure
The information was gathered through two different methods: self-distributed and self-administered questionnaire online. Prior to the commencement of the survey, a pre-test was carried out among 10 respondents outside the study who are not part of the sample to assess the face validity and reliability of the instrument. After that the formal survey took place over two months. Participants were allowed one week to load the survey, and reminders were sent over time to achieve a high response rate, as observed by Dewi et al. (2025). The study questionnaire was electronically sent to participants in various sites across the participating multinational corporations. Such limited collection was necessary to allow

enough time for the respondents to give accurate answers- and hence improve the quality of the collected data.

d. Validity and Reliability Testing
The validation and reliability of the questionnaire instrument was pre-tested before analysing the data. Construct validity was applied in order to verify that the questionnaire measures what is supposed to do. epoch and validated the questionnaire for construct validity. Cronbach's Alpha, from Amalia et al, was utilized to examine Reliability, which analyzes the internal consistency of the instrument. (2022). The reliability test results revealed a Cronbach Alpha of greater than 0.7, which is a confirmation of the reliability of the questionnaire.

e. Data Analysis
Data analysis Two primary statistical analyses were preformed after data collection. Descriptive statistics were used to report the demographic characteristics of the respondents, and the response distribution for each indicator, as mentioned by Wahyu Sri Kunanti et al. (2022). These statistics were frequencies of response to show how often a response was given, percentages of response to show what percent of all respondent chose one category, and mean to determine overall trends in ratings. Further, several regression analyses were applied to examine the impact of cloud computing-based HRIS on the efficiency of HR management. This regression model provides results that enable the identification of cloud computing systems' effect on human resource management, given that this effect is significant. The IVs for the regression model is ease of use, integration, accessibility, reliability and DV is HR management efficiency (i.e., saving cost, reducing time, improving accuracy, customer satisfaction).

This research employs a quantitative method with a causal-descriptive type and aims at investigating the effects of adopting a cloud computing-based HRIS on the efficiency of HR management in multinational companies. The study was carried out in ten companies that met the selection criteria; a total of 150 employees who were respondents to surveys received them either directly or through an online form. The validity of instruments utilized was tested for construct validity by Cronbach Alpha check. Descriptive statistics were utilized to examine the respondent characteristics, and multiple linear regression was used to examine the relationship between technology adoption and the effectiveness of HRM.

3. RESULTS AND DISCUSSION

3.1. Result

3.1.1. Respondent Description

The 150 participants in this study were HR managers, HR staff, and HRIS end users of cloud computing based HRIS in multinational companies. Participants were chosen based on predetermined criteria and were between 25 and 50 years of age. Most participants had over 5 years experience in the field of HR management. The respondents were selected those who have been knowledge to the implementation of cloud-computing s in HRMS in their firms. Through the inclusion of several positions, the research intended to gain a variety of viewpoints on the effects of cloud computing technology in improving HRM efficiencies.

Table 1. Respondent Description

Category	Frequency	Percentage
Age 20-30 Years	30	20%
Age 31-40 Years	90	60%
Age 41-50 Years	25	17%
Age 51+ Years	5	3%
Gender Male	70	47%
Gender Female	80	53%
Education Bachelor's	120	80%
Education Postgraduate	30	20%

Table 1 Descriptions of the survey respondents according to age, sex and education Most respondents aged 31-40 years (60%), whereas the 20-30-year age group (20%) is the next most frequent. The sample consists mostly of females (53%) in terms of gender. With respect to education attainment, 80% of the respondents graduated and the other 20% were postgraduate. These data give an impression of the age distribution of subjects who took part in the survey.

3.1.2. Analysis of HR Management Efficiency

From the information derived from the survey, the application of a cloud computing based-HRIS has greatly increase the efficiency of HR management in Multinational Corporation (Sinaga et al., 2025). A

number of significant findings demonstrate that the implementation of this system increase the speed and efficiency of administrative applications, decrease operational expenditure, and improve the quality of managed data. The ability to use HR information in real time to make decisions was noted in responses. Furthermore, the adoption of cloud computing means that time with administrative matters is saved and that the relative ease and interlinkage of use in other systems of the company are increased. In sum, the results from this study indicate that the adoption of a cloud-computing HR-information-system, positively influences HR-management efficiency in multinationals.

Table 2. Indicators and Research Results

Indicator	Average Score (Likert 5-point)	Respondent Frequency (%)	Description
Operational Cost Savings	4.2	85	Users reported significant reductions in operational costs due to decreased reliance on local infrastructure.
Process Time Reduction	4.5	78	Respondents noted that the cloud system accelerates HR processes such as recruitment, training, and payroll management.
Data Accuracy Improvement	4.4	82	Employee data is more accurate and consistent after the implementation of the cloud-based system.
User Satisfaction	4.6	90	The majority of respondents expressed satisfaction with the ease of use and the results obtained from the system.

The adopted studies of cloud computing HRIS are summarized in Table 2. Operational cost savings was median rated at 4.2, with 85% of respondents scoring high for cost savings. Reduction of process time rated 4.5; 78% indicated that HR processes became faster. Increase in data accuracy was at 4.4 with 82% of the votes and more accurate and consistent data were also mentioned. A user satisfaction score of 4.6 was achieved and 90% of respondents reported satisfaction with the system overall and with the ease of use and results from using the system.

3.1.3. Multiple Linear Regression Analysis

A multiple linear regression test was also done to investigate the relationship between the adoption of cloud computing-based HRIS and Human Resource Management (HRM) efficiency. The results of analysis indicate that the variables of ease of use, system integration, data accessibility and system reliability are significantly related to HR management efficiency. User-friendliness and system dependability, as well as system integration and data accessibility, had the strongest influence on efficiency, although with less relevance. In sum, the regression results verified that adopting a cloud-based payroll system can benefit HR management efficiency, especially considering cost saving, processing time, and data integrity. Such findings underline the signifi cance role of technology in managerial compliance in HR management in MNCs.

Table 3. Multiple Linear Regression Analysis

Independent Variable	Coefficient (β)	Sig. (p-value)
Ease of Use	0.35	<0.01
System Integration	0.22	0.05
Data Accessibility	0.28	0.03
System Reliability	0.32	<0.05

Interpretation of Regression Results

a. Ease of Use (β =.35, p <.01) means that the ease of use significantly influences on HR management efficiency. Simpler the system, faster the HR management!
b. System Reliability (β = 0.32, p < 0.05) significantly affects HR management efficiency, which suggests, the more reliable the system is, the greater the HR management efficiency.
c. System Integration (β = 0.22, p = 0.05) contributes moderated but still significantly to HR management efficiency. This would imply that a system which is well integrated with other systems within the enterprise can improve efficiency.

Data Accessibility (β = 0.28, p = 0.03) also has a significant positive impact, which indicates that the easier the access to HR data, the more effective management will be.

3.1.4. Validity and Reliability Testing

Validity and Reliability Test To make sure that the research instrument in analyzing the influence of implementing a cloud computing-enabled HRIS on the efficiency of HR management in multinational

companies is valid and reliable, validity and reliability testing was done. Firstly, the validity test checks whether the instrument actually measures what it is supposed to measure, while the reliability test examines the reliability of the instrument circulating over stable and accurate data. Both the tests are necessary in order to verify that the data collected from respondents is reliable and truly represents the reality. Thus, the tool that it adopted can get reasonable and consistent results in our study.

a. Validity Test

The purpose of the validation test is to determine whether the instrument (in this case questionnaire) measures the intended construct (effect of implementation cloud computing based HRIS on HR management efficiency in Multi-national companies). Validity testing of construct validity of the scale was carried out using the factor analysis with the KMO (Kaiser-Meyer-Olkin) test for sample sufficiency. A KMO value of 0.87 was obtained, which was above the required value for factor analysis. The factor analysis showed that all the questions had loaded on the factor value greater than 0.5, refers that all the questions are valid for measuring the variable for the construct used. The factoring analysis of cloud computing-based HRIS implementation and HR management efficiency variables indicates that the instrument employed in the research is reliable.

Table 4. Factor Analysis Results for Cloud Computing-Based HRIS Implementation

Item	Factor Loading
Ease of Use	0.76
System Integration	0.80
Data Accessibility	0.81
System Reliability	0.74

Table 5. Factor Analysis Results for HR Management Efficiency Variable

Item	Factor Loading
Operational Cost Savings	0.78
Reduction in Processing Time	0.82
Improved Data Accuracy	0.76
User Satisfaction	0.85

According to the results in the factor loadings, all the factors had factor loading factors higher than 0.5, showing that the construct validity of all factors were good for the analyzed constructs. To examine content validity, expert opinions were sought from five professionals in the domains of HRIS and cloud computing. Their comments were used to assess whether the questionnaire items were adequately covering all the relevant facets of the variables. The items for both the cloud-based HR systems and HR management dimensions were verified by experts. As a result of their feedback some of the items in the questions were rephrased to refine for relevancy or to ensure the tool accurately measured the targeted constructs.

b. Reliability Test

The purpose of the reliability test was to check the degree of consistency and precision of the research instrument. Reliability was measured by Cronbach's Alpha values, which indicated the extent to which each questionnaire question gave a consistent result. The instrument had excellent internal consistency with an overall Cronbach's Alpha coefficient of 0.89. If the α is higher than 0.7, it indicates that the questionnaire is reliable and can be used for further research.

Table 6. Cronbach's Alpha Reliability Test Results

Variable	Cronbach's Alpha
Cloud-Based Human Resource Information System Implementation	0.85
HR Management Efficiency	0.88

The Cronbach's Alpha scores for each key variable show good reliability (all greater than 0.7). This means that the instrument is reliable to measure the construct. In addition to the instrument's overall reliability, reliability was also tested with respect to each of the dimensions of the instrument, so as to lay assurance that all of them measure the intended variables in a reliable manner. To examine the reliability of each dimension was to ensure that the measure yields consistent and dependable results over various situations. This step is necessary to ensure that all aspects of the instrument related to the usage of cloud-based human resource information systems as well as efficiency of HR management properly reflect the linked variables. Indicators for each dimension are well constructed with high levels of internal consistency as shown in the following Cronbach's Alpha values.

Table 7. Cronbach's Alpha Values for Research Dimensions

Dimension	Cronbach's Alpha
Ease of Use	0.83
System Integration	0.80
Data Accessibility	0.81
System Reliability	0.79
Operational Cost Savings	0.84
Reduction in Processing Time	0.86
Improved Data Accuracy	0.80
User Satisfaction	0.87

From the reliability test, it was indicated that all dimensions in this task force have high Cronbach's Alpha values, demonstrating that these dimensions are dependable towards measuring the factors associated with the implementation of cloud-based human resource systems and the effectiveness of HR management, respectively.

3.2. Discussion

Cloud based function of human resource information system has brought a new proposition and added value to the management of human resource management for some multinational companies. As explained by Utami et al. (2024), cloud computing enables companies to work with HR data in a more effective manner, minimize reliance on expensive hardware and makes the data access more quick. Local infrastructure, and hence operational costs, can be minimized.

The results of the present study are also in line with those of Pratama et al., 2024), based on which, cloud computing increases the operation productivity by supporting the real-time information retrieval. Cross-regional teams communicate more easily and efficiently among different time zones. This study also discovered that HR management processes, such as recruitment, training, and payroll, became quicker and more accurate once a cloud-based system was adopted. These findings are in line with those of Aziz and Wardhani (2018) who reported that cloud computing facilitates a better integration and more efficient employee data management.

The findings also strengthen the evidence provided by Sharma et al. (2024), who focused on the role of system integration in the field of HR management. Cloud computing allows organisations to stitch different parts of the organisation together, enhancing interdepartmental co-ordination and enabling the sharing of information required to make decisions.

System reliability has also been identified as a key factor to enhance efficiency. The stability of cloud-based platforms was found to have a strong impact on the effectiveness of HR administration in this study. Reputable solutions depend on better collection of employee data which results in more reliable decision making. This is consistent with Gautam et al. (2025) underlined that the reliability of cloud system services can improve the overall performance of a company by providing the continuous availability of accurate gathered data.

In terms of user satisfaction, the results show that most of the participants were satisfied their level of satisfaction with having an easy use and result (easy test scheduling, perform the test, test results and feedback for test result) cloud system. This is consistent with the results of Abugre and Nasere (2020) who continue to find that adoption of cloud technologies led to higher employee performance, facilitated by HR processes becoming more organized and effective.

Cloud computing-based HRIS adoption has demonstrated to increase efficiency of HR management, specifically in such areas as decreased costs, shortened speed of processing, better quality of data and higher level of user satisfaction. These findings emphasize the high value of cloud technology in achieving more productive, streamlined and powerful HR. Reliability, user-friendliness, system integration and data entry are important aspects companies should take into account to get the most out of this technology. To this end, MNCs that respond to the call of utilizing cloud computing are expected to better cope with global pressures as well as enhance the efficiency of management and HR performance.

4. CONCLUSION

The study confirms the positive relationship between the introduction of cloud-based human resource information systems and the effectiveness of human resource management in multinational enterprises. Empployee data centralized to ensure real-time flow and decision making. Cloud computing allows employees' data to be accessed from anywhere. This technology also decreases dependence on local infrastructure, leading to enormous operation cost savings. Petitioners averred that there has been a substantial decrease in the time that processing is taking for different HR-related matters, including recruitment and training. Additionally, cloud-based systems were demonstrated to increase HR data accuracy by providing higher quality, more uniform data at all study times. Satisfaction among users got better too, the

report indicates, with majority of the respondents saying that the system was simpler to use and access. The well-being of HR management most affected by the ease of use and the system reliability, more influenced also from system integration and the data accessibility. Increased efficiencies in HR operations: Multinationals can work more effectively and tackle HR management challenges in multiple locations thanks to their use of cloud-based HR information systems.

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